

Sangola Taluka Shetkari shikshan Prasarak Mandal's

VIDNYAN MAHAVIDYALA, SANGOLA

(Teaching Plan)

Department Of chemistry

Name of Faculty: **Mr. Adlinge N. P.** (Associate Professor)

Academic Year: **2019 – 20**

Class: **B.Sc. II**

Semesters: **III**

Paper No. : **V**

Paper Name: **Organic chemistry**

Sr.No.	Class	Month	Chapter Details
1	B.Sc. II	July	UNIT-I 3. Alcohols and Phenols (8) 3.1. Alcohols : Introduction i. Dihydric alcohols : Nomenclature, Methods of formation of ethylene glycol from ethylene, ethylene dibromide and ethylene oxide, physical properties & chemical reactions of ethylene glycol – acidic nature, reaction with hydrogen halide, oxidation – lead acetate, HIO ₄ and nitric acid, Uses of ethylene glycol. Pinacol formation, Pinacol-Pinacolone rearrangement and its mechanism. ii. Trihydric alcohols: Nomenclature, Methods of formation of glycerol – from fats and oils physical properties. Chemical reactions of glycerol – reaction with electropositive metals, reaction with hydrogen halide HCl and HI Reaction with conc. nitric acid in presence of conc. sulphuric acid. Reactions with potassium hydrogen sulphate, esterification, oxidation. Uses of glycerol. 3.2. Phenols : Introduction, Reactions of phenol (carbolic acid) : i. Acylation and Fries rearrangement ii. Ether formation and claisen rearrangement iii. Gattermann Synthesis

			iv. Carboxylation – Kolbe’s reaction v. Reimer – Tiemann reaction and its mechanism.
2	B.Sc. II	August	1. Spectroscopic Methods (8) Ultra-Violet (UV) absorption: Introduction to Spectroscopy, Beer – Lambert law (mathematical derivation not expected), Types of electronic transitions, Terms used in UV spectroscopy: Chromophore, Auxochrome, Bathochromic Hypsochromic, Hypochromic and Hyperchromic shifts, Effect of conjugation on position of UV and visible bands. Calculation of max by Woodward-Fieser rules for conjugated dienes and enones. Applications of UV spectroscopy – Determination of structure and stereochemistry (cis and trans) spectral problems based on UV. (Spectroscopic charts will not be supplied) 2. Stereochemistry (8) 2.1. Geometrical isomerism: Introduction, Geometrical isomerism in aldoximes and ketoximes, configuration of ketoximes-Beckmann transformation (Mechanism & Proof are not expected) configuration of aldoximes. 2.2. Conformational Isomerism: Introduction, conformation of ethane and n-butane and their representation by using Saw-Horse, Fischer (dotted Wedge line) and Newmann’s projection formulae. 2.3. Conformational analysis of ethane and n-butane with the help of energy profile diagrams. 2.4. Nomenclature – D & L, R & S, E & Z systems
3	B.Sc. II	September	UNIT- II 4. Aldehydes and Ketones (5) Introduction, Nomenclature, structure and reactivity of the carboxyl group. Mechanism of nucleophilic additions to carbonyl group. Study of following reactions with mechanism and applications 1) Aldol condensation (base catalysed), 2) Perkin reaction, 3) Cannizzaro’s reaction, 4) Knoevenagel reaction 5) benzoin condensation.. 5. Ethers and Epoxides (5) 5.1. Ethers : Introduction, Nomenclature, Methods of formation of anisole by Williamson’s synthesis and from diazomethane, chemical reactions of anisole with HI, Gravimetric estimation of –OCH₃ group by

			Ziesel's method (Related problems are expected based on % of $-OCH_3$ and number of $-OCH_3$ groups). 5.2. Epoxides : Introduction, Nomenclature, commercial method of preparation of ethylene oxide. Acid and base catalysed ring opening of ethylene oxide, reactions of Grignard and organolithium reagents with ethylene oxide.
4	B.Sc. II	October	6. Carboxylic acids (7) 6.1. Monocarboxylic acids : Introduction. Methods of formation of Halo acids, di- and trichloroacetic acid by HVZ reaction, substitution reactions of monochloroacetic acid by nucleophiles CN, OH, I, and NH_3. 6.2. Hydroxy acids : A. Malic acid and B. Citric acid, Methods of formation of malic acid from maleic acid and from α-bromo succinic acid. Reactions of malic acid – action of heat, oxidation reaction and reaction with HI, uses of malic acid. Methods of formation of citric acid from glycerol. Reactions of citric acid: Acetylation with acetic anhydride reduction by HI, Action of heat at $4220K$. Uses of citric acid. 6.3. Unsaturated acids : Methods of formation A. Acrylic acid from acrolein and by dehydration of β-hydroxy propionic acid. Reactions of acrylic acid – Addition of H_2O, reduction by Na / C_2H_5OH. Uses of acrylic acid. Methods of formation B. Cinnamic acid from benzaldehyde using diethyl malonate and by using acetic anhydride and sodium acetate. Reactions of cinnamic acid – bromination, oxidation. Uses of cinnamic acid. 6.4. Dicarboxylic acids : Succinic and phthalic acids. Methods of formation of succinic acid from ethylene bromide, maleic acid. Reactions of succinic acid – action of heat, action of $NaHCO_3$, C_2H_5OH in presence of acid. Uses of succinic acid. Methods of formation of phthalic acid from o-xylene and naphthalene Reactions of phthalic acid – action of heat, reaction with sodalime, NH_3. Uses of phthalic acid. 7. Diazonium Salts (4) 7.1 Diazonium salts : Introduction, benzene diazonium chloride – preparation, chemical properties. i Formation of iodo benzene ii Sandmeyer's reaction iii Formation of benzene iv. Formation of

			phenylhydrazine v. Azo coupling – synthesis of methyl orange and congo red.
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